THE PARTICIPATION OF THE UNIVERSITY STUDENT IN HIS EVALUATION: A COLLABORATIVE WORK TEACHING EXPERIENCE

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Abstract

During the academic years 2016-17 and 2017-18, an experience based on collaborative work has been carried out by the students and this activity has been evaluated by themselves. It has been tried to involve the student in his evaluation process because his work has been valued by his classmates. The student makes an individual evaluation of the work presented and defended in class by his classmates. This presented work deals with one of the eight lessons of the compulsory subject "Construction Equipment, Installation and Auxiliary Resources" of the third year of the Degree in Technical Architecture at the University of Alicante. The evaluated task has been a poster about the chosen topic. This poster has been explained by the students in class. As soon has the activity finished, a brief questionnaire must be answered. Each student must valued the work that their classmates have just presented. This questionnaire is designed by the teachers and unknown by the students. During this experience the student becomes aware of their own progress and perhaps the most important, he or she knows how their progress is valued by the rest of their classmates. The poster allowed them to work as a team, develop the ability to speak in public, synthesize constructive techniques and adopt a critical attitude to real situations related with the construction sector.

Keywords: Higher education, evaluation, poster, collaborative work.

1 INTRODUCTION

In line with studies already done on how to propose work structures that promote participation, autonomous learning and critical assessment of students in Higher Education [1] and, within the teaching and learning process of systems constructive in the field of architecture and construction [2] [3], a next phase of work is proposed in which the evaluation is considered as an element that motivates the student [4] [5]. In the totality of the teaching-learning-assessment process, the latter is the exclusive domain of the lecturer and it is thought that, by involving the students in the evaluation process, they will improve the teaching-learning process by lending greater interest and participation in the classrooms [6].

Currently the number of students enrolled in the Degree in Technical Architecture has decreased considerably and, if we add to this that the level of attendance of the student to the theoretical classes is also decreasing, makes the teacher consider the need to develop new techniques of work that allow to value the learning that the student is doing during the semester. The vast majority of students show a greater interest in passing than in learning. In addition, the fact that currently working with small groups is possible makes teachers think of assessment activities as a learning task, including students in the evaluation of these activities, thus proposing a peer evaluation strategy. Examples of experiences developed in this framework show the improvement of student learning by improving their self-esteem and increasing their academic performance [7] [8] [9] [10]. All this indicates that the teaching process is changing in the Spanish university system tending towards more active work methodologies that allow the student to be the protagonist of their learning [11] [12]. In this sense, and already implemented in the subject, a methodology of work based on dynamic strategies, promoting debate, reflection, teamwork and decision making [13] [14] came the moment of involve and motivate the student in decision making, giving autonomy to be involved in the process of evaluation of the subject, assessing a practical activity among all the scheduled, understanding this task as a part of the collaborative learning that teachers carry implanting in the subject "Construction Equipment, Installation and Auxiliary Resources" of the third year of the Degree in Technical Architecture since 2016.

1.1 Purpose

The general objective of this research is to experiment - with students of Higher Education - a methodology of work based on the participation of the student in the continuous evaluation of the subject with the evaluation among them. The work is concreted by sharing the results of the experience carried out with the students during the first four months of the academic year 2017/2018. In this experience, the work of the teacher has been a facilitator and strategist with the sole purpose that students come to value the teamwork, thus achieving greater participation and ability to develop the skills acquired together with a greater knowledge of the theoretical content of the subject [15].

With the participation and involvement of the students in the evaluation process of the subject, the following particular objectives were marked:

- To encourage greater participation and communication between students and the teacher in the theoretical classes.
- To improve the theoretical-practical learning together with a greater acquisition of the specific competences of the subject, in order to improve the academic performance of the students.
- To create greater cooperation with teamwork to strengthen the personal safety of each student and understand the importance of well done and well structured work. Bring the ideas that arise to the action, sharing them with colleagues, enhancing and improving communication and creating debates among themselves and between them and the teacher.
- To check if they have an adequate level of maturity to carry out group work and evaluate them fairly.
- To contrast and compare the evaluation made by the students with the teacher, verifying if the approach and the methodology of work carried out for the integration of the student in the evaluation process of the subject, offers enough and adequate information to continue working and investigating about it.

2 METHODOLOGY

2.1 Description of the context and the participants

This study tries to answer if including students in the process of evaluation of a subject, within the context of university education, greater cooperation is achieved with teamwork to strengthen the personal safety of each student and understand the importance of working well made and well structured, in addition to studying whether they value this evaluation system positively and have a favorable attitude towards evaluating the work of their peers and towards their own or their group's.

This experience has been put into practice with the students enrolled in the course “Construction Equipment, Installation and Auxiliary Resources” of the Degree in Technical Architecture of the University of Alicante. The choice of this subject is due to the fact that it is compulsory, of 6 credits, it is taught in the first semester and it is the third year of the Degree, which makes the students participating in the experience have certain skills, already acquired in the field of constructive procedures and, certain maturity and ability to evaluate each other. The group taught in the morning schedule was selected, consisting of 21 students, of whom 17 participated the day in which they evaluated each other, Table 1.

Table 1: Participation of the student in the joint evaluation experience.

Course	No. Of enrolled students	Experimental group	No. of students in experimental group	Nº of participants	% of participation of students in the group
3	34	Grupo 1 (morning)	21	17	80.95%

It is remarkable that, being a small group of students, they have been able to carry out other evaluation alternatives, in which the student has been involved positively attending more to the classes, collaborating in the debates raised after the theoretical classes and carrying out practices of information search on the contents of the subject. Throughout the semester, we have been able to

follow up on each student, highlighting the importance of working in a group, assessing their learning and that of their classmates.

2.2 Instruments

Thinking about problem-solving skills and the character of improvisation that often appears in the field of application of the course “Construction Equipment, Installation and Auxiliary Resources”, it was necessary to select a tool that would reflect, within the scope of the subject, those skills, concepts and basic elements that demonstrate the level of understanding of the topics discussed and explained in the classroom by the teacher.

The didactic tool selected for the students to evaluate if their classmates had or did not acquire some specific competences of the subject was the realization, presentation and defence in front of their peers of a poster. This helps them to represent in a graphic and summarized way the message they want to convey, while at the same time they are involved in the management of design software and bibliographic resources [16] [17] [18]. At the beginning of the semester they carry out a course of informatics and informational skills of intermediate level that helps them to look for more specific information and to use tools to generate and organize contents.

In order that all students could evaluate the same parameters, the teacher designed a questionnaire consisting of three parts, the first corresponds to four questions on the topic defended, the second to two questions about the group of students that has exposed and the poster is defended and, in the third, an evaluation of the poster is done. All questions were scored on a scale of 1-5 according to the level of agreement, 1 was the lowest rating and 5 the highest, Fig. 1.

CONSTRUCTION EQUIPMENT, INSTALLATION AND AUXILIARY RESOURCES
Academic year 2017-18
Escale from 1 (less important) to 5 (much important)

ON THE DEFENDED TOPIC: Group 1 Number:	1	2	3	4	5
How interesting do you find the topic dealt with?					
Importance that you think it has regarding the technical architect's training					
Do you agree that the poster expresses, summarizes and visualizes what has been said during the presentation?					
How original is the presented poster?					

ON THE GROUP THAT HAS MADE THE PRESENTATION	1	2	3	4	5
Indicate how much the defence of the poster has helped you better understand the topic and solve any possible doubts you had.					
Well shown and explained information.					

ASSESSMENT	1	2	3	4	5
Poster content					
Defence and exposition					
Technology used to make the poster					
Utility that has for the students the fact of carrying out these presentations					

COMMENTS:

Figure 1: Questionnaire model designed for peer evaluation.

At the end of the term and finish the experience, a survey is written to receive feedback from students who have participated, in order to know what they thought about the experience and in general, about the methodology of work carried out during the semester in the subject, Fig. 2.

Level of effort	Acquired knowledge		
Level of effort that has devoted to the course	Level of abilities or knowledge at the beginning of the course	Level of abilities or knowledge after the course	How has the course contributed to improve your abilities or knowledge?

Abilities and dedication of the lecturer			
Explanations were clear and well structured	The lecturer stimulated students' interest	The lecturer made a suitable use of the available timing	The lecturer was attentive and willing to help

Course content				
The participation in evaluation of the subject, increased interest of participation, improvement and performance.	The content was well organized and planned	The workload was appropriate	The students have work actively in The lessons	Do you consider The course of The library useful?

General concepts		
Which aspects of the subject do you find more useful?	How would you improve The subject?	Do you consider The time devoted to each subject has been adequate? would you make any change?

Figure 2: Survey model designed to ensure the validity of the new work strategy proposed in the subject and evaluate the teaching activity carried out during the semester.

2.3 Process

To carry out the implementation and development of this experimental study framed within a teaching experience, different research methods and techniques have been used, organized in five phases that evolve from the general study to the particular one. In each of these phases a specific work is developed that will mark the trajectory of the experimental study. The qualitative approach has been based on the search for information, observation, data collection of the presentation and defense by the students of the poster made and the debates generated on real situations that affect the execution of a building. The quantitative approach has been based on conducting surveys at the beginning and end of the study and comparing the results obtained from the students who participated, with the results of the teacher's assessment tests [19].

In order to achieve the planned objectives, the following phases were developed:

Phase 1: **information and preparation, by the teacher, of the work plan foreseen for the realization, delivery and presentation of the poster**. Students were given a schedule of activities that began with the formation of the working groups and the choice of the theme that would be developed in the poster among the contents published in the teaching guide of the subject. Once the groups were formed and the topics selected, the date of presentation and defense of the poster was added to the schedule, informing them that this phase would be submitted to evaluation by their peers. Parallel to this information, the minimum contents, the structure and the presentation format of the poster were described. An academic structure was selected so that it would be easier to make an evaluation scale and also for the student to become familiar with it since, in a year, they will complete the Final Degree Project.

Phase 2: presentation and defense of work carried out. In total 10 posters were presented, all of them were hung in class jointly and each group defended and presented theirs in public. At the end, all the posters allowed to visualize the collective and collaborative work that they had done and particularly, it was seen that the group had followed the structure marked by the teacher and which was not. This allowed us to see in a global way the capacity for synthesis and coordination that some groups had and others did not. The teacher also used the session to establish feedback with students to reflect on the papers presented and value them seriously.

Phase 3: peer evaluation. Once the exhibition and defense of the poster by the corresponding group has been completed, the model of questionnaire designed by the professor, Fig.1, is provided to the rest of the classmates and individually, to qualify it. The final grade of each poster, obtained as a weighted average, represents 15% of the total value of the continuous assessment of the subject.

These qualifications were compared with those of the professor, obtaining results and adequate conclusions.

Phase 4: evaluation of the teaching activity through the survey designed to ensure the validity of the experimental work carried out in the subject, Fig. 2. At the end of the semester, and a month and a half after finishing the experience of evaluating the posters of their own classmates, a survey is sent to all the participants with the objective of knowing their opinion about the experience carried out. Of the 21 students who participated, only 9 answered it.

Phase 5: analysis and comparison of qualitative and quantitative data. Once the data obtained from this teaching research experience has been sorted, the results obtained have been analyzed and compared to know and establish conclusions about the participation of the Higher Education student in the evaluation process of a subject.

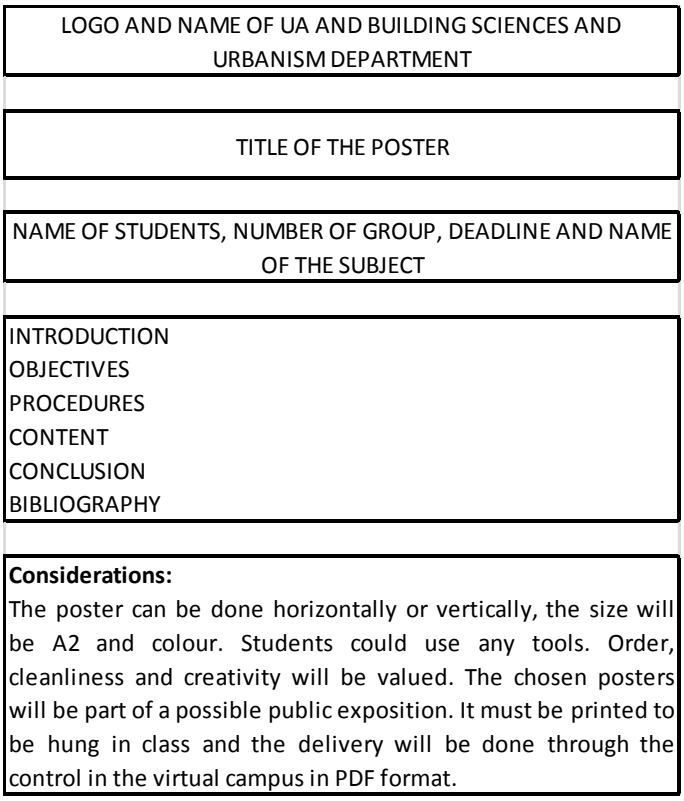

Figure 3: Model structure and format of the poster.

3 RESULTS

Next, the most significant results are exposed, trying to clarify mainly two issues; On the one hand, what have been the results on the improvement in the participation of the student in their training and, on the other, what have been the results of the evaluation among them, comparing them with the evaluation made by the teacher.

The study sample analyzed, referring to Group 1, was formed by a total of 10 posters formed by 2 members, except group 9 formed by 3 members. As a first point, it should be noted the high participation in the activity - 80.95% - which implies a good acceptance of new teaching methodologies, including the evaluation process.

In *Table 2: Results of the evaluation*, grades are collected on 5 points awarded by both the teacher and the students. The scores are agreed by both in all cases, with the exception of group 3 and group 9, whose deviation exceeds one. In the rest of the cases, the deviation - understood as the difference between the teacher's and the student's evaluations-ranges between-0.24 in group 2 and -0.86 in group 6. All the deviations have negative values, in as much as, the students have valued with higher grades than the teacher. Only this trend is reversed in group 4 and group 8 but the values are negligible (0.26 and 0.28 respectively). Group 3 is the one with the highest discrepancy of grades, with a deviation of -1.08. Only this value exceeds group 9, which presents the most marked difference -

1.69. The deviation of this last group is justified by a penalty in the note by the teacher of -1 point in the overall score, due to the delivery of the poster after the deadline. This fact was not taken into account in the assessment by the students, so it is excluded from the analysis.

Table 2: Results of the evaluation.

No. poster/students		Puntuation over 5 points			
Number	**Components**	**Lecturer (a)**	**Student (b)**		**DEVIATION (a-b)**
			Average	**Average professor-student**	
1	2	4,0	4,41	4,21	-0,41
2	2	4,0	4,24	4,12	-0,24
3	2	3,0	4,08	3,54	-1,08
4	2	4,5	4,24	4,37	0,26
5	2	3,8	4,53	4,14	-0,78
6	2	3,0	3,86	3,43	-0,86
7	2	3,8	4,43	4,09	-0,68
8	2	4,5	4,22	4,36	0,28
9	3	2,0	3,69	2,84	-1,69
10	2	3,8	4,12	3,93	-0,37

With all these data, of the 10 posters presented only 20% have a lower grade on the part of the students that, of the teacher, 80% have a deviation that does not reach the point and only 10% overcome a discrepancy of grades between the evaluation of the teacher and the classmates above the unit.

The results show a high level of evaluation of the papers presented by the students, even though they have errors in format and content, but the vast majority values the effort that the poster has made for them and defending it in front of their classmates.

According to the previous statement most of the failures penalized by the teacher are related to the formal aspect. The lack of experience of the students in organizing the content of the works at an academic level of Higher Education, is an adverse condition that will be reflected years later when they face their Final Degree Project. However, regarding the content there were no conceptual failures of importance, since this activity was developed in the last week of the semester, when the student has already acquired all the knowledge of the subject.

Another result not without relevance, is the substantial increase in the improvement of academic performance. Taking as a reference the final data of minutes of the C2 call of the last 3 years, the total percentage of approved (approved and notable), represents 69% in the 2015-16 academic year, 25% in the 2016-17 academic year and 61% in the 2017-18 academic year. The 2015-16 course is taken as a reference since the evaluation system was totally different. There were 2 test-type exams with 4 response options and the poster presentation system had not been implemented yet. The high number of approved (69%) leads to error, since it is not consistent with a high level of learning. Faced with this situation, the teachers of the subject denoted a lack of theoretical knowledge with the evaluation system with test questions and it was decided for the following academic year 2016-17 to eliminate this evaluation system and replace it with short development questions, where the student better demonstrates their skills and competences based on what they have learned.

In this current academic year 2017-18, where the evaluation conditions are the same as those of the 2016-17 academic year, in view of the percentages of approvals obtained (61%), if the significant increase in the number of students approved can be corroborated, Fig. 4.

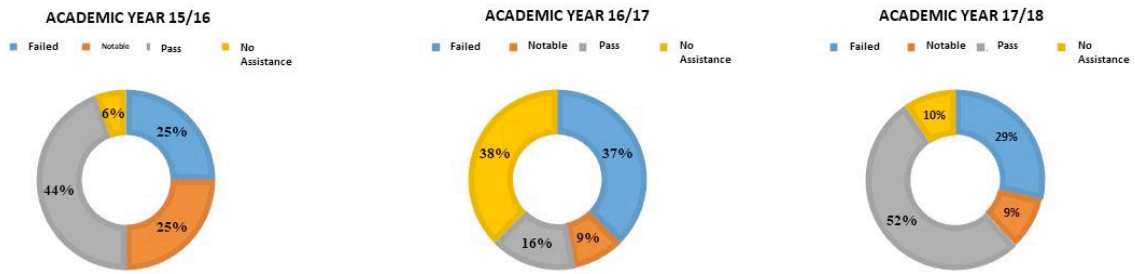

Figure 4: Evaluation of the student's academic performance.

Regarding the results obtained with this learning system, based on the results of the surveys that were completed at the end of the semester, Fig. 2, we can see how the students have an increase in their level of skills or knowledge at the end of the course, being its maximum appreciation of satisfactory, compared to a very low assessment at the beginning of the course, Fig. 5 left and center. The following extrapolatable result of the research is the assessment on the students' appreciation of the methodology of the course, considering it very good to improve their skills and knowledge, Fig. 5 right.

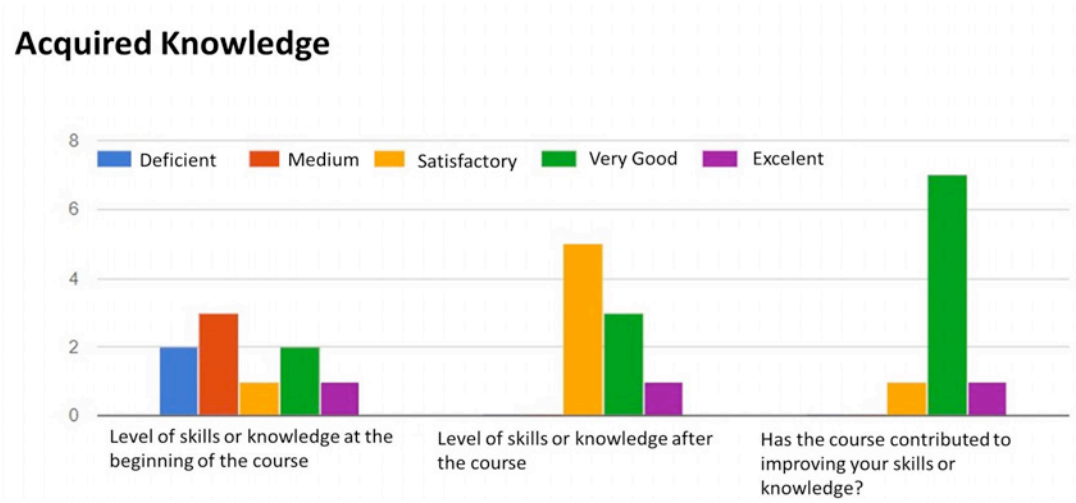

Figure 5: Acquired knowledge. Assessment of students based on the surveys.

Last, but not least, is the result obtained with the surveys on the assessment of the level of effort dedicated to the signature. This data is not trivial and especially in the last years of the Degree, where fatigue and haste to finish studies are counterproductive in learning, since students sometimes put the final result in the subject without considering their acquisition valuable or not of competences. The level of effort considered most is satisfactory, Fig. 6.

Figure 6: Level of effort. Assessment of students based on the surveys.

4 CONCLUSIONS

With this pilot experience regarding the participation of the university student in the evaluation process, it is concluded that the changes in the new teaching methodologies cover a wide spectrum that ranges from how to teach, with more participatory scenarios and away from the master classes, until how to evaluate, an area in which until not too long ago was only viable the assessment of the lecturer.

Given the possibility of the student to evaluate their peers, the recognition of the skills acquired is accentuated, the effort is valued and the weaknesses to be improved are highlighted. The evaluation among students gives a real perspective of what is considered as the limit of learning, hence its assessment is not negligible.

This experience has served as a preliminary step to a future that they will soon have to assume - the realization of their Final Degree Project - where they will respond to some format roles of academic works of research projects to which they are not accustomed. With activities such as the realization and defence of posters, they start in this way of working, although with the limitations of being an integral part of a subject and not having the Final Degree Project entity as is obvious. But for many it is their first contact with the formal aspect. In this starting point of training in this matter, it is necessary to put in value the specific courses of information search, offered by the General Library of the University of Alicante, where the student is taught to screen the technical information looking for specific webs, or how to learn to quote or reference bibliography among others.

Secondly, with the implementation of this work system, students have been motivated to attend class and work collaboratively, increasing their academic performance with respect to other years. The increase of the academic performance not only supposes an acquisition of contents, it is much more, it is an increase of abilities, its improvement in self-esteem, its loss of reluctance to participate in class, its valuation of effort and the most relevant thing: to know like the others colleagues value their training.

Finally, highlight the position of teachers throughout the process. Trying to increase the level of effort and the positive attitude towards learning in the subject “Construction Equipment, Installation and Auxiliary Resources” is our proposed challenge for future courses.

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